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COMPLETE SPECIFICATION

Improvements relating to relatively movable, contacting bodies

We, KURT KASCHKE, of 24 Markt, Obernzell, Germany, and HANS VOGT, of Erlau, near Passau, Germany, both of German nationality, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to bodies which have surfaces adapted to move or slide over one another, and particularly to a coating which may be applied to a part or the whole of at least one of such surfaces.

In various fields of engineering, it is necessary to use bodies which slide or are displaced with great frequency on a surface, in a tubular guide, in or on a guide rail or slipper, in a tapped hole or thread guide, in or on a bearing, or in co-operation with other sliding bodies or connections. When it is important to keep the kinetic or sliding friction between the sliding surfaces of the bodies as low as possible, without using liquid or pasty lubricants or greases, and nevertheless, in certain positions of operation, to ensure a locking, engaging or holding effect between the bodies which are displaceable or adjustable relatively to each other, the sliding surfaces must exhibit properties which meet these requirements. Various materials, lubricants, or the like are already known for these purposes. The invention provides a lubricant or coating suitable for the purposes referred to by utilizing the fundamental properties of polyethylene, or substances having similar physical characteristics, such as polyvinyl chloride. Such plastic materials are, according to the invention, applied under initial stress in the form of a film on one of the sliding surfaces, thus causing the film to adhere to the surface of the relevant body. In such manner, the good lubricant or sliding properties of plastic material are suitably utilized, and it is then immaterial in what manner the sliding bodies are moved against or over one another.

A particularly advantageous field of application for the coatings according to the invention occurs wherever it is important to equalise, neutralise, or compensate for a play which is unavoidable in manufacture, for example between sliding bodies in tubular guides or conductors, or of threaded bodies in tapped holes, such for example as in loading coils in electrical engineering, particularly in the communications art, where a core is held in a tapped hole in coil support or former and is adjustable in this support or former by a screwing motion. The elasticity of the plastic material forming the coating permits small or negligible differences in diameter between the tapped hole member and the screw-threaded member of the adjustable core to be equalised without difficulty, which equalisation or compensation is of the utmost importance in the mass production of such coils. The fact that the static friction between the sliding bodies provided with a coating of a resilient plastic material, is the same, or almost the same, as the kinetic or sliding friction in the adjustment of the bodies, makes it possible to effect even the finest adjustments of the core smoothly. Thus, as compared with other devices or means, which are based on providing resilient parts for obtaining a locking effect between the female thread and the screw-threaded core, the advantage is obtained that the screw-threaded body is adjustable in its tapped hole or guide thread under the initial stress formed by the elastic or resilient layer, and by this initial stress is held substantially completely free from play and is maintained more or less free from vibration in the position into which it has been adjusted, without the smooth adjustability of the core or bolt in its female thread being impaired.

The high elasticity and ductility or expansibility of the coating according to the invention may be utilized with particular advantage when, for example, in a threaded dust core a tubular film-layer is drawn with initial stress over the thread, that is to say, over the periphery of the core, which film lies on the crests of the thread

and does not completely fill out but spans the grooves or troughs disposed between two crests of thread thus forming a substantially elastic variable pitch or variable depth of thread on the core. In this manner, even a relatively large play between the female thread and the thread of the bolt or core may be equalised without impairing the smooth adjustability of the threaded core in its tapped hole.

The coating may be drawn over any extended body, such as a rod or bolt, in the form of a tube, the walls of which are foil-thin, which implies that the method of treatment is simple. It is then immaterial what cross-sectional shape the rod or bolt has and, within certain limits, differences in the cross-section or diameter of the rod or bolt are equalized by the elasticity of the plastic material. Such an application is particularly advantageous in coating a threaded bolt with a flexible tube of a plastic as hereinbefore described. The flexible tube may be replaced in a simple manner by a piece of film or foil which is laid in the form of a strip or in any other suitable manner around the rod or bolt, and which may be initially stressed and attached to the rod or bolt in the form of a sheath, by glueing, welding or the like. It may even be sufficient merely to provide on a threaded bolt or on the threaded adjustable core of a high-frequency coil, longitudinal strips or longitudinal borders of the plastic material, which extend over part of the periphery and which equalise resiliently, that is to say with initial stress, the play existing between the screw bolt and the female thread by pressing the bolt or core unilaterally against the female thread.

The use of these resilient equalising coatings, longitudinal strips or the like, is particularly suitable for shaping or forming sintered ferrite cores into threaded adjustable cores, since the coating film, straps or strips due to their high resilience, and to their good lubricant or sliding properties, allow comparatively great differences between the guide thread and the core thread to be equalised. Nevertheless, the important requirement of smooth adjustment of the core is met even with relatively different stress between the core and the female thread.

A coating according to the invention may also be applied with advantage to a shaft or spindle to provide an anti-friction bearing surface for the shaft or spindle.

The invention, as applied to adjustable cores of coils used in the communications art, is illustrated by way of example in the accompanying drawing, which shows an adjustable core of iron or iron dust, its tapped hole or thread guide being formed by a coil supporting tube or former.

A foil-thin piece of flexible tube 2, of a resilient thermoplastic material is drawn with initial stress over the threaded adjustable iron dust core 1. The flexible tube 2 spans the thread turns 3, so that a substantially elastic thread guide is provided when the core 1 is screwed into the female thread 4 of the coil supporting tube 5. The film coating 2 may alternatively be formed by a piece or strip of film which is laid around the thread of the core, but which also need only enclose or cover part of the periphery of the core.

Differences in diameter over the length of the core, for example, in long open cores, such as are used for permeability tuning, may be equalised by a coating of plastic material. It is also possible to use a coating of this type to give a movement free from play in the coil supporting tube or former of the permeability tuning set just as other core arrangements may also be provided in an advantageous manner with coatings of plastic material as a protection from moisture or for any other reasons.

Due to the great elasticity, and good slidability of the material used, the coatings according to the invention are also adapted to form guide threads without the coating forming thread turns while being prepared and without the coating forming threads in combination with the coated body before being screwed in. It is also possible to provide on a thread-less bolt or adjusting core, longitudinal strips which, to form the thread, are moulded from plastic material which will then engage free from play in the female thread thus making adjustment of the bolt or the adjusting core possible by screwing.

What we claim is:—

1. A body having a surface in sliding contact with another body, the surface being provided with a coating of a resilient, thermoplastic material which is applied to the surface under initial stress.

2. A body according to claim 1, in which the body is formed with a screw-thread, particularly a screw-threaded adjusting core of iron or iron powder, in which the coating is formed by a tubular film which is drawn with initial stress over the screw-threaded body.

3. A body according to claim 1, in which one or more strips of a resilient thermoplastic material are applied under initial stress to the periphery of the body and are secured to the body by glueing or welding.

4. A body according to claim 1, which is adapted to be displaced within a screw-threaded female member, the thread of the female member being impressed into the coating when the body is screwed into the female member.

5. A body according to claim 1, comprising a cylindrical member, particularly an iron powder core or a sintered ferrite core, having a smooth or substantially smooth surface to which is applied with initial stress a coating of a resilient thermoplastic material, whereby the coating forms a resilient guiding means free from play for the cylindrical member in a mating tubular member.

6. A body according to claim 1, in which the coating, which is applied in the form of a

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film, forms the bearing surface of a shaft or spindle.

7. An adjustable core of an electrical coil unit, in which the surface of the core which moves relatively to and in contact with another member of the unit is provided with a film of a resilient thermoplastic material which is applied to the core under initial stress.

8. A body according to any one of the preceding claims, in which the resilient thermoplastic material is polyethylene or a substance having similar physical characteristics.

9. A body having a surface in sliding contact with another body, substantially as hereinbefore described.

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757,487 COMPLETE SPECIFICATION
1 SHEET

This drawing is a reproduction of the Original on a reduced scale.